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Applicant : David M. Baggett

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Serial No. : 09/877,159

Examiner : Mooneyham, Janice A.

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Title : TECHNIQUE FOR PRODUCING CONSTRUCTED FARES

**Mail Stop Appeal Brief - Patents**

Commissioner for Patents

P.O. Box 1450

Alexandria, VA 22313-1450

APPEAL BRIEF ON BEHALF OF DAVID M. BAGGETT (CORRECTED)

The Appeal Brief fee of \$500 was already paid. This Brief is revised according to the examiner's contention that the Summary of the Claimed Subject Matter did not conform to the requirements of 37 C.F.R. 41 37(c), as containing extraneous matter.

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July 25, 2006  
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Marie Collins

**(i.) Real Party In Interest**

The real party in interest in the above application is ITA Software, Inc.

**(ii.) Related Appeals and Interferences**

The appellant is not aware of any appeals or interferences related to the above-identified patent application.

**(iii.) Status of Claims**

This is an appeal from the decision of the Primary Examiner in an Office Action dated October 11, 2005, finally rejecting claims 1-46 and 52-55, all of the claims of the above application. The claims have been twice rejected. Claims 1-46 and 52-55 are the subject of this appeal.

**(iv.) Status of Amendments**

All amendments have been entered. Appellant filed a Notice of Appeal on **February 15, 2005**.

**(v.) Summary of Claimed Subject Matter**

**Claim 1**

One aspect of Appellant's invention is set out in claim 1, as method of producing a constructed fare that includes an arbitrary added to a published fare. The method is executed in a computer system having memory and a persistent storage device. "Referring now to FIG. 1, a computer system 10 includes a CPU 12, main memory 14 and persistent storage device 16 all coupled via a computer bus 18. [Specification page 5, line 24 to page 6, line 8].

Inventive features of claim 1 include preprocessing by determining interior cities that appear with gateway cities in arbitraries for an airline. "Referring now to FIGS. 2A-2D, preprocessing 30 to precompute 32 \*\*\* a list 38a of gateway cities {C2} (FIG. 2B), ... \*\*\* such that when the fare construction process accesses the table by an (airline, interior-city) pair the \*\*\* returns \*\*\* the list 38a of gateway cities {C2} for which an airline "A" has arbitraries that specify the interior city C1. [Specification page 7, lines 6-16]. [T]he arbitraries being published

amounts and an order set of two cities that extend published fares that include an amount for travel between two cities to provide a bi-directional market. "An arbitrary, like a published fare, lists two cities. However, unlike cities in a published fare (which establish a bidirectional market), the cities in an arbitrary are ordered: the first is the gateway (or major) city, and the second is the interior (or minor) city." [Specification page 1, lines 23-28].

Inventive features of claim 1 also include searching a database having published fares for gateway cities corresponding to the determined interior cities appearing in the arbitraries. "The constructed fares process 30 retrieves 48 from the list 38b \*\*\* a city "C3" that forms a published fare with city "C2" for airline "A." [Specification page 10, lines 15-18].

Inventive features of claim 1 also include producing the constructed fare by applying an arbitrary corresponding to one of the interior cities to a published fare involving one of the gateway cities that corresponds to the determined interior cities appearing in the arbitraries to produce a constructed fare and storing the constructed fare in memory or the persistent storage device of the computer system for use in planning, faring and/or pricing. "The fare construction process 40 retrieves 44 an interior city from a list of interior cities "C1" that are part of an arbitrary for the airline "A." The fare construction process 40 retrieves 46 a city C2 from the list 38a \*\*\* of all of the cities "C2" that form arbitraries C1-C2 for city "C1" for airline "A." The constructed fares process 30 retrieves 48 from the list 38b \*\*\* a city "C3" that forms a published fare with city "C2" for airline "A." The fare construction process 40 tries 50 to produce a constructed fare for the C1-C2-C3 city combinations." [Specification page 10, lines 9-22].

#### Claim 14

Claim 14 claims a method of producing a set of constructed international fares for a particular airline, the method executed in a computer system. This feature is supported by the analogous feature of claim 1. [Specification page 5, line 24 to page 6, line 8].

Inventive features of claim 14 include preprocessing by determining interior cities that appear with gateway cities in arbitraries for the particular airline. This feature is supported by the analogous feature of claim 1 [Specification page 7, lines 6-16], arbitraries being published amounts and an ordered set of two cities that extend published fares that include an amount for travel between two cities to provide a bi-directional market and searching a database for gateway

cities corresponding to the determined interior cities appearing in the arbitraries. [Specification page 1, lines 23-28].

Inventive features of claim 14 also include producing the constructed fares by applying arbitraries corresponding to the determined interior cities to published fares involving the gateway cities that corresponds to the determined interior cities appearing in the arbitraries to produce the set of constructed fares for the airline. This feature is supported as by the analogous feature of claim 1. [Specification page 10, lines 10-23].

Inventive features of claim 14 also include storing the constructed fares in memory or the persistent storage device of the computer system for use in a travel related activity. [Specification page 5, line 24 to page 6, line 8; page 10, line 25].

#### Claim 22

Another aspect of the invention is covered by claim 22. Claim 22 is directed to a computer program product residing on a computer readable medium, for producing constructed fares that includes an arbitrary added to a published fare. [Specification page 3, line 22, page 5, line 24 to page 6, line 8; page 10, line 25].

Inventive features of claim 22 include instructions causing a computer system to preprocess data to determine interior cities that appear with gateway cities in arbitraries for the airline, arbitraries being published amounts and an ordered set of two cities that extend published fares that include an amount for travel between two cities to provide a bi-directional market. This feature is supported at least by the analogous feature of claim 14. [See Specification page 7, lines 10-16 and page 1, lines 23-28].

Inventive features of claim 22 also include instructions to search for gateway cities corresponding to the determined interior cities appearing in the arbitraries. This feature is supported at least by the analogous feature of claim 1. [Specification page 9, lines 10-13].

Inventive features of claim 22 also include instructions to produce the constructed fare by applying an arbitrary corresponding to one of the interior cities to a published fare involving one of the gateway cities that corresponds to the determined interior cities appearing in the arbitraries to produce the constructed fare. This feature is supported at least by the analogous feature of claim 1. [Specification page 10, lines 10-23].

Inventive features of claim 22 also include instructions to store the constructed fare in a computer readable medium for use in a travel related activity. This feature is supported at least by the analogous feature of claim 14. [Specification page 5, line 24 to page 6, line 8; page 10, line 25].

### Claim 35

Another aspect of the invention is covered by claim 35. Claim 35 is directed to a computer program product for producing a set of constructed international fares for an airline. [See Summary page 3, lines 21-24].

Inventive features of claim 35 include instructions to preprocess data by instructions to determine interior cities that appear with gateway cities in arbitraries for the airline, arbitraries being published amounts and an ordered set of two cities that extend published fares that include an amount for travel between two cities to provide a bi-directional market. This feature is supported at least by the analogous feature of claim 14. [See Specification page 7, line 10-16 and page 1, lines 23-28].

Inventive features of claim 35 also include instructions to search for gateway cities corresponding to the determined interior cities appearing in the arbitraries. This feature is supported at least by the analogous feature of claim 1. [Specification page 9, lines 10-13].

Inventive features of claim 35 also include instructions to produce fares by instructions to apply each arbitrary corresponding to each of the determined interior cities to published fares involving the gateway cities that correspond to the determined interior cities appearing in the arbitraries to produce the set of constructed fares. "Referring now to FIGS. 4A-4C, a fare construction process 40' to construct two and three-component constructed fares, i.e., two arbitraries combined with one published fare is shown. In the embodiment 40', there is an additional loop. The fare construction process 40' is similar to the process 40 up to when the fare construction process tries 50 to construct a two-component constructed fare. The fare construction process 40' retrieves 51a a second interior city C4 from a list of interior cities "C4" that are part of an arbitrary that exists for city C3 for the airline "A." The fare construction process 40 retrieves 44 a city C4 from the list 38c \*\*\* of all of the cities "C4" that form arbitraries C3-C4 for gateway city "C3" for airline "A." The fare construction process 40' tries 51b to

produce a constructed fare for the C1-C2-C3-C4 city combinations. The fare construction process 40 will determine 51c if the C1-C2-C3-C4 constructed fare is valid. If it is valid it is stored 54a or otherwise noted, and then a pointer (not shown) is incremented to get 51d the next C4 city. If there are more C4 interior cities, the fare construction process 40' will retrieve the next interior city C4 and the fare construction process will continue. If all cities C4 have been tested, it will continue from testing 52 the C1-C2-C3 two component constructed fare as described above. This embodiment 40' produces two-component and three-component constructed fares, i.e., two arbitraries combined with one published fare." [Specification page 11, line 12, page 12, line 4].

Inventive features of claim 35 also include instructions to store the constructed fares to a computer memory or persistent storage for use in a travel related activity. This feature is supported at least by the analogous feature of claim 14.

#### Claim 43

Another aspect of the invention is covered by claim 43. Claim 43 is directed to a computer system including a processor, a memory for storing instructions executed by the processor and a storage medium storing a computer program product for producing a set of constructed international fares for an airline. This feature is supported at least by the analogous feature of claim 14. [Specification page 5, line 24 to page 6, line 8].

Inventive features of claim 43 include instructions to preprocess data by instructions to determine interior cities that appear with gateway cities in arbitraries for the airline, arbitraries being published amounts and an ordered set of two cities that extend published fares that include an amount for travel between two cities to provide a bi-directional market. This feature is supported at least by the analogous feature of claim 14. [See Specification page 7, line 10-16 and page 1, lines 23-28].

Inventive features of claim 43 also include instructions to search for gateway cities corresponding to the determined interior cities appearing in the arbitraries. This feature is supported at least by the analogous feature of claim 1. [Specification page 9, lines 10-13].

Inventive features of claim 43 also include instructions to produce constructed fares by instructions to apply each arbitrary corresponding to each of the determined interior cities to

published fares involving the gateway cities that corresponds to the determined interior cities appearing in the arbitraries to produce the set of constructed fares. This feature is supported at least by the analogous feature of claim 35. [Specification page 11, line 12, page 12, line 4].

Inventive features of claim 43 also include instructions to store the constructed fares in a computer memory or persistent storage for use in a travel related activity. This feature is supported at least by the analogous feature of claim 14. [Specification page 5, line 24 to page 6, line 8; page 10, line 25].

#### Claim 52

Another aspect of the invention is covered by claim 52. Claim 52 is directed to a method of producing a set of constructed international fares for an airline, the method executed in a computer system. This feature is supported at least by the analogous feature of claim 1. [Specification page 5, line 24 to page 6, line 8].

Inventive features of claim 52 include preprocessing by accessing a first hash table structure stored in computer memory by airline interior city pair to return a list of gateway cities for which an airline has arbitraries that specify the interior city, "Referring now to FIGS. 2A-2D, preprocessing 30 to precompute 32 a first hash table 37a to produce a list 38a of gateway cities {C2} (FIG. 2B), ... " \*\*\* The first hash table 37a is constructed 32 such that when the fare construction process accesses the table by an (airline, interior-city) pair the hash table 37a returns in constant time, the list 38a of gateway cities {C2} for which an airline "A" has arbitraries that specify the interior city C1 [Specification page 7, lines 6-16], with arbitraries being published amounts and an ordered set of two cities that extend published fares to the gateway city from interior cities that include an amount for travel between two cities to provide a bi-directional market. "An arbitrary, like a published fare, lists two cities. However, unlike cities in a published fare (which establish a bidirectional market), the cities in an arbitrary are ordered: the first is the gateway (or major) city, and the second is the interior (or minor) city." [Specification page 1, lines 23-28].

Inventive features of claim 52 also include accessing a second hash table structure stored in computer memory by airline gateway pair to return a second list of gateway cities that an airline publishes fares from to determine a gateway to another gateway city. "The second hash

table 37b is produced 34 in a similar manner. The difference is that the process to produce 34 the second hash table iterates over the set of all international published fares rather than the set of all arbitraries." [Specification page 8, lines 5-8].

Inventive features of claim 52 also include producing constructed fares by, applying the first arbitraries from the first hash table to the published fares from the second hash table to return a list of potential constructed fares. "The fare construction process 40 retrieves 44 a city C2 from the list 38a (via an access to the first hash table 37a) of all of the cities "C2" that form arbitraries C1-C2 for city "C1" for airline "A." The constructed fares process 30 retrieves from the list 38b (via an access to the second hash table 38a) a city "C3" that forms a published fare with city "C2" for airline "A." The fare construction process 40 tries 50 to produce a constructed fare for the C1-C2-C3 city combinations." [Specification page 10, lines 12-20].

Inventive features of claim 52 also include determining whether a constructed fare in a list of constructed fares is a valid constructed fare and for valid ones of the potential constructed fares producing the constructed fares. "The fare construction process 40 will determine 52 if the C1-C2-C3 constructed fare is valid." [Specification page 10, lines 23-24].

Inventive features of claim 52 also include storing the constructed fares in a computer memory or persistent storage for use in a travel related activity. This feature is supported at least by the analogous feature of claim 14. [Specification page 5, line 24 to page 6, line 8; page 10, line 25].

**(vi.) Ground of Rejection to be Reviewed on Appeal**

Claims 1-46 and 52-53 stand rejected under 35 U.S.C. 103, as being unpatentable over "Gardner," in view of Applicant's Background of the Invention (Appellant's Admitted Prior Art) and ATPCO Manual May 22, 1995.

**(vii.) Argument**

**Obviousness**

"It is well established that the burden is on the PTO to establish a prima facie showing of obviousness, *In re Fritsch*, 972 F.2d. 1260, 23 U.S.P.Q.2d 1780 (C.C.P.A., 1972)."



"It is well established that there must be some logical reason apparent from the evidence or record to justify combination or modification of references. *In re Regal*, 526 F.2d 1399 188, U.S.P.Q.2d 136 (C.C.P.A. 1975). In addition, even if all of the elements of claims are disclosed in various prior art references, the claimed invention taken as a whole cannot be said to be obvious without some reason given in the prior art why one of ordinary skill in the art would have been prompted to combine the teachings of the references to arrive at the claimed invention. *Id.* Even if the cited references show the various elements suggested by the Examiner in order to support a conclusion that it would have been obvious to combine the cited references, the references must either expressly or impliedly suggest the claimed combination or the Examiner must present a convincing line of reasoning as to why one skilled in the art would have found the claimed invention obvious in light of the teachings of the references. *Ex Parte Clapp*, 227 U.S.P.Q.2d 972, 973 (Board. Pat. App. & Inf. 985)."

"The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984).

Although the Commissioner suggests that [the structure in the primary prior art reference] could readily be modified to form the [claimed] structure, "[t]he mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." *In re Laskowski*, 10 U.S.P.Q. 2d 1397, 1398 (Fed. Cir. 1989).

"The claimed invention must be considered as a whole, and the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination." *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick*, 221 U.S.P.Q. 481, 488 (Fed. Cir. 1984).

Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under Section 103, teachings of references can be combined only if there is some suggestion or incentive to do so. *ACS Hospital Systems, Inc. v.*

*Montefiore Hospital*, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984)  
(emphasis in original, footnotes omitted).

"The critical inquiry is whether 'there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination.'" *Fromson v. Advance Offset Plate, Inc.*, 225 U.S.P.Q. 26, 31 (Fed. Cir. 1985).

## **Discussion**

### **Background**

The invention relates to a process for producing constructed fares.

Airlines publish fares for various markets. A market is a city pair such as NYC-PAR (New York-Paris). For markets involving major cities like the NYC-PAR market, airlines provide published fares, that is, stated prices for travel between the two cities. For markets involving minor cities, however, the airlines rely on a process called fare construction to produce fares that are sometimes called "constructed fares." Fare construction is particularly used for minor markets involving international travel.

There are too many markets for airlines to actually publish fares for every single market. For example, for the OME-NCE (Nome, Alaska/Nice, France) market, there may not be a published fare because the Nome-Nice market may be too small for airlines to actually publish fares. Nevertheless, the airlines need to be able to offer some price for an OME-NCE ticket. The fare construction process solves this problem by providing a mechanism to "extend" a published fare with "add-ons" also called "arbitraries," in order to derive prices to minor cities.

One approach used for fare construction is to use a list of constructed fares called "The Unpublished Fares Product" that is available from Airline Tariff Publishing Company (ATPCO). ATPCO is an intermediary that maintains fares published by airlines and resellers. With "The Unpublished Fares Product" a cross-product of all arbitraries and all base fares is determined and provided into a list. That list can contain millions of constructed fares. [Specification page 1, lines 54-23].

Appellant's fare construction process makes computation of constructed fares more efficient than other approaches. Appellant recognized that relatively few cities are actually part

of arbitraries. In other words, the complete set of arbitraries on all carriers only covers a small portion of the total set of cities. One key to rapidly enumerating constructed fares, therefore, is to start only with interior cities known to appear in some arbitraries. In addition, the fare construction process takes into consideration that there is no need to consider all cities in the world for gateway cities. Rather, it is only necessary to consider those cities as gateways if the city is involved in some arbitrary whose interior city is the city currently being examined in the process.

**Claims 1-46 and 52-53 are neither described nor suggested by the combination of Gardner and Applicant's admitted prior art and ATPCO May 22, 1995.**

Claims 1, 7, 10, 13, 22, 28, 30, 31, and 34

For the purposes of this appeal only Claims 1, 7, 10, 13, 22, 28, 30, 31 and 34 stand or fall together. Claim 1 is representative of this group of claims.

Claim 1 is directed to a computer implemented method of producing constructed fares. Claim 1 includes the features of preprocessing by determining interior cities that appear with gateway cities in arbitraries for an airline, the arbitraries being published amounts and an order set of two cities that extend published fares ... to provide a bi-directional market and searching a database having published fares for gateway cities corresponding to the determined interior cities appearing in the arbitraries. Claim 1 also includes the feature of producing the constructed fare by applying an arbitrary corresponding to one of the interior cities to a published fare involving one of the gateway cities that corresponds to the determined interior cities ... to produce a constructed fare and storing the constructed fare ... for use in planning, pricing and/or pricing. Appellant contends that Gardner in combination with Appellant's admitted prior art fails to suggest these features.

In rejection of claim 1, the examiner contends that Appellant's admitted prior art (at page 1 of the specification ) and Gardner (Figure 7 of Gardner, Unpublished Fare Retrieval, Published Fare Retrieval, page 7, [0093-01021]) teaches the claimed pre-processing. The examiner equates gateways with major HUBs (but does not provide any basis for their equivalence).

The examiner also argues that Gardner teaches searching a database having published fares for gateways, as the major HUB cities, corresponding to the determined interior or minor cities appearing in the fares at Figure 7b - 8a, page 7 [0095-0097].

The examiner relies on Gardner to teach producing the constructed fare at Fig. 8a), page 7 [0097] and applying a fare corresponding to one of the interior (minor) cities to a published fare at page 7 [0095-0098]. The examiner relies on Gardner to teach storing the constructed at (pages 7 and 8, [0093-0104], Fig. 8(a). The examiner then goes on to reason that:

**Gardner discloses published fares and unpublished fares. A published fare is defined in ATPCO as an amount published for use in pricing air transportation from one city to another city. This would include gateway cities and minor cities. An unpublished fare is the combination of an add-on amount and a published fare amount resulting in an amount used in pricing air transportation from one city to another city. Unpublished fares are also referred to as "through fares," "constructed fares" and "behind point fares." page 58 of ATPCO. Gardner does not explicitly disclose arbitrary fares.**

**However, ATPCO discloses arbitrary fares as an amount published for use only in combination with other fares for the construction of through fares, also referred to as "proportional fare," "basing fare" or "add-on fare (page 58)." ATPCO also discloses addons or arbitrary fares as being bidirectional and that the first city displayed is the gateway (page 60). ATPCO further discloses add-on plus published fare equals unpublished or constructed fares (page 58).**

**It would have been obvious to one of ordinary skill in the art at the time of the invention to incorporate arbitrary fares as taught by ATPCO with the published fares as taught by Gardner since Gardner discloses unpublished fares which is an add-on amount and thus an arbitrary for the purpose of providing better passenger service.**

Appellant's Background neither describes nor suggests the claimed preprocessing that determines interior cities that appear with gateway cities. While Appellant's specification discloses fare construction and discloses the terms "gateway," "interior cities" and "arbitraries," nothing in Appellant's background can be construed to suggest, much less describe, the recited preprocessing by determining interior cities that appear with gateway cities in arbitraries for an airline ... or the feature of searching a database having published fares for gateway cities corresponding to the determined interior cities appearing in the arbitraries.

The examiner states that "An unpublished fare is the combination of an add-on amount and a published fare amount resulting in an amount used in pricing air transportation from one city to another city." Indeed Appellant disclosed as much in the specification at page 1:

For markets involving major cities like the NYC-PAR market, airlines provide published fares, that is, stated prices for travel between the two cities. For markets involving minor cities, however, the airlines rely on a process called fare construction to produce fares that are sometimes called "constructed fares." ... The fare construction process solves this problem by providing a mechanism to "extend" a published fare with add-ons also called arbitraries, in order to derive prices to minor cities. An arbitrary, like a published fare, lists two cities. However, unlike cities in a published fare (which establish a bidirectional market), the cities in an arbitrary are ordered: the first is the gateway (or major) city, and the second is the interior (or minor) city. [Specification page 1, lines 6-28].

However, neither this disclosure nor elsewhere is there described preprocessing that determines interior cities that appear with gateway cities, as recited in the claim. All that this excerpt describes is that fare construction involves extension of published fares. It says nothing regarding the recited preprocessing.

The examiner also relies on Figure 7 of Gardner, Unpublished Fare Retrieval, Published Fare Retrieval, page 7, [0093-01021]. However, these teachings are even less relevant to this claim feature of the claims in general. In these paragraphs, Gardner merely describes a system that can access published fares and unpublished fares. However, Gardener offers no techniques for construction of the unpublished fares. Rather, Gardner teaches to access an unpublished fares table. Indeed, Gardner does not even describe what is meant by the unpublished fares that the examiner relies on.

The examiner, relying on page 58 from ATPCO, argues that: "A published fare is defined in ATPCO as an amount published for use in pricing air transportation from one city to another city." Appellant does not dispute this. However the examiner then goes on to say that: "This would include gateway cities and minor cities." Appellant disagrees. Indeed, if this conclusion could be drawn from ATPCO, there would be no need for fare construction or unpublished fares since if a published fare was defined a travel between gateways and minor cites all fares would be published fares and there would not be any unpublished fares, at least as that term is used by ATPCO and Appellant. Page 58 of ATPCO is reproduced below:

#### PRINCIPLES OF FARE CONSTRUCTION

##### DEFINITION OF PUBLISHED FARE

Published fare means an amount published (filed/GFS'd) for use in pricing air transportation from one city to another city. Published fares price in fare quote systems.

##### DEFINITION OF ARBITRARY

Arbitrary means an amount published for use only in combination with other fares for the construction of through fares. It is also referred to as "proportional fare", "basing fare", and "add-on-fare". Arbitraries cannot be priced in fare quote systems.

##### DEFINITION OF UNPUBLISHED FARE

Unpublished fare means the combination of an add-on amount and a published fare amount resulting in an amount used in pricing air transportation from one city to another city. Also referred to as "through fares", "constructed fares" and "behind point fares". Unpublished fares price in fare quote systems.

This is how unpublished fares are constructed:

add-on	+	published fare		=	unpublished fare	
published fare	+	add-on		=	unpublished fare	
add-on	+	published fare	+	add-on	=	unpublished fare

In no sense therefore can the term "published fare" be construed to "include gateway cities and minor cities." as contended by the examiner.

Appellant contends that any purported combination of Gardner with ATPCO and Applicant's admitted prior art would merely result in the conventional approach a "cross product," as disclosed by Applicant at page 2, as set out below.

One approach used to fare construction is to use a list of constructed fares called "The Unpublished Fares Product" that is available from Airline Tariff Publishing Company (ATPCO). ATPCO is an intermediary that maintains fares published by airlines and resellers. With "The Unpublished Fares Product" a cross-product of all arbitraries and all base fares is determined and provided into a list. That list can contain millions of constructed fares.

The examiner also argues that Gardner teaches searching a database having published fares for gateway (major, HUB) cities corresponding to the determined interior (minor) cities appearing in the fares at Figure 7b - 8a, page 7 [0095-0097]. In the quote passages Gardner discusses fare components. However, the concept of fare components is directed to finding fares that can be used with flights to produce travel options. They have no relevance to the claimed

“fare construction.” ATPCO clearly makes note of the idea that arbitraries cannot be priced in fare quote systems. Hence, the fare components mentioned by Gardner are not directed to the use of arbitraries or unpublished fares, as contended by the examiner. Indeed, claim 1 also requires: “searching a database having published fares for gateway cities corresponding to the determined interior cities appearing in the arbitraries.” The examiner has not shown any searching of published fares for gateway cities corresponding to the determined interior cities appearing in the arbitraries to exist in either the background or in Gardner, and specifically fails to point out that feature in Gardner.

The examiner also relies on Gardner to teach producing the constructed fare at Fig. 8(a), page 7 [0097] and applying a fare corresponding to one of the interior (minor) cities to a published fare at page 7 [0095-0098]. Appellant disagrees. In the cited passages of Gardner as elsewhere in Gardner there are no teachings of fare construction. Indeed, Gardner discloses at 0098:

**For each component identified, pricing services driver 180 typically will seek to determine the unpublished fare for the component. This process typically involves retrieving the agreements and calling unpublished footnote retrieval/validation module 190. After doing this, the unpublished fare is retrieved using unpublished fare retrieval/validation module 194. Next, the published routings retrieval/validation module 196 is called. Additionally, the process returns an array of unpublished fares.**

However, Gardner merely seeks to find fares for trip components. For instance in [0096] Gardner teaches: “[0096] Fare component identification module 184 identifies possible trip components within an itinerary.” Thus, the component that is discussed in Gardner is a trip component and the pricing services driver finds unpublished fare for the component by retrieving agreements calling unpublished footnote retrieval/validation module 190 and after that retrieving the unpublished fare using unpublished fare retrieval/validation module 194. Gardner fails to suggest “fare construction” and in particular is totally devoid of “applying an arbitrary corresponding to one of the interior cities to a published fare involving one of the gateway cities that corresponds to the determined interior cities appearing in the arbitraries to produce a constructed fare.”

The examiner's motivation to incorporate "arbitrary fares" as taught by ATPCO with the published fares as taught by Gardner is that Gardner discloses unpublished fares, "which is an add-on amount and thus an arbitrary for the purpose of providing better passenger service." However this motivation is illogical. First, ATPCO clearly sets out that arbitraries are not fares. Second, by the examiner's own admission, ATPCO discloses published fares and indeed discloses the very "addons" or arbitraries used to extend the published fares, indeed ATPCO also discloses unpublished fares. Why would one of ordinary skill in the art use ATPCO to include arbitraries and thus modify Gardner, which fails to disclose any of these features?

Appellant further contends that the motivation of "providing better passenger service" is without import to the claimed invention, because Gardner fails to disclose any fare construction process. Rather, Gardner merely accesses a database of unpublished fares, e.g., the conventional "The Unpublished Fares Product" from Airline Tariff Publishing Company (ATPCO). Gardner is directed to offering travel solutions not fare construction. Thus, because Appellant's invention is directed to more efficient techniques of producing "constructed fares," the motivation predicated on providing "better passenger service" is insufficient and irrelevant.

#### Claims 2 and 23

For the purposes of this appeal only Claims 2 and 23 stand or fall together. Claim 2 is representative of this group of claims. Claim 2 recites that determining interior cities includes accessing a hash table indexed by an airline, interior-city pair to return a list of gateway cities for which an airline has arbitraries that specify the interior city.

Although not addressing claim 2 specifically, the examiner argues that:

**accessing a hash table indexed by an airline, interior-city pair to return a list of gateway cities for which an airline has arbitraries (add-on fares) that specify the interior city (Fig. 7b and page 7 [0093] thru page 8 [0104]). [Final Action page 5]**

Gardner fails to suggest a hash table specifically in the cited passages or elsewhere and indeed Gardner fails to suggest: "accessing a hash table indexed by an airline, interior-city pair to return a list of gateway cities for which an airline has arbitraries that specify the interior city." Indeed, this deficiency follows from Gardner because Gardner fails to suggest the preprocessing recited in the base claim 1. Gardner is not directed to "fare construction." Indeed, Gardner



describes in [0104] that: "The process will proceed by selecting the cheaper between the unpublished and published price and returning the lowest ticket price and booking information. FIG. 7b illustrates the processing flow of pricing services driver 180." Thus, in [0103 to 0104] Gardner merely discusses a process to retrieve fares and combine fares with itineraries and select the lowest of the fares to return to a user. This is a so called "faring process" not fare construction as referred to in Applicant's admitted prior art or ATPCO.

#### Claims 3 and 24

For the purposes of this appeal only Claims 3 and 24 stand or fall together. Claim 3 is representative of this group of claims. The examiner urges that Gardner discloses ... "accessing a hash table returns the list in constant time (Fig. 7b-8a)." Again however, Gardner does not disclose a hash table as in base claim 2 or the preprocessing in claim 1 thus could not possible suggest claim 3.

#### Claims 4-6 and 25-27

For the purposes of this appeal only Claims 4-6 and 25-27 stand or fall together. Claims 4-6 and 25-27 are each distinctly allowable over the references.

Claim 4, which recites: "accessing a hash table indexed by an airline, gateway pair to return a list of gateway cities that an airline publishes fares from the determined gateway to another gateway city," and claim 5, which recites: "accessing a first hash table indexed by an airline, interior-city pair to return a list of gateway cities for which an airline has arbitraries that specify the interior city and searching ... comprises accessing a second hash table indexed by an airline, gateway pair to return a second list of gateway cities that an airline publishes fares from the determined gateway to another gateway city," are not suggested by any combination of the cited references.

No combination of the references suggests hash tables. Appellant contends that the references fail to appreciate the benefit of preprocessing as in claim 1 or accessing hash tables indexed according to the elements of claims 4 and 5. Claim 6 again directed to "constant time" is not disclosed or suggested by any combination of the cited references.

### Claims 9 and 29

For the purposes of this appeal only Claims 9 and 29 stand or fall together. Claim 9 is representative of this group of claims. Claim 9 recites: "determining if an entry in a construction table was memoized before accessing the construction table, and if the entry was memoized, retrieving an answer from a store of memoized entries to apply to the constructed fare." The feature of "memoization" is disclosed by Appellant in the Specification at page 14, line 25, as:

Referring now to FIG, 5, to save time when constructing large numbers of fares, a PO2 procedure retrieval 80 uses a process called memoization. Memoization is a technique for speeding up certain kinds of algorithms. If an expensive procedure is called many times, and if the procedure's output depends only on the input (i.e., the answer is not dependent on any external factors, such as the current time), then memoization can be used. To memoize PO2 retrieval, the PO2 procedure call 80 forms a query 82 involving the constructed fare. The memoization retrieval process 80 has a store 88 of past queries and associated answers. If the memoization retrieval process 80 determines that the query has been stored, it is retrieved from the store 92. Otherwise, a procedure call for the PO2 record is produced and used to access the record from a remote database. The answer from the remote database is stored in the memoization store 88 for future references.

The examiner fails to point out this feature in Gardner and instead merely makes a reference to Fig. 8a fare component. However, Gardner does not teach a memoization procedure. The fare components are not memoized entries, e.g., the result of a memoized procedure previously acting on the entry.

### Claims 11 and 32

For the purposes of this appeal only Claims 11 and 32 stand or fall together. Claim 11 is representative of this group of claims.

Claim 11 further limits claim 1 by including features of determining a second set of interior cities that appear with a second gateway city in the published fare for the airline and applying an arbitrary that extends the published fare to a city from the second set of interior

cities to produce a three component constructed fare "i.e., two arbitraries combined with one published fare is shown." [Appellant's specification page 11, lines 13-15].

Again, Gardner fails to suggest determining interior cities that appear with a second gateway city. Moreover, Gardner fails to suggest applying the arbitrary to extend the published fare. While Applicant's admitted prior art and ATPCO clearly disclose extending a published fare with an arbitrary, it is clear that neither Applicant's admitted prior art nor ATPCO determine a second set of interior cities that appear with a second gateway city in the published fare for the airline.

#### Claims 12 and 33

For the purposes of this appeal only Claims 12 and 33 stand or fall together. Claim 12 is representative of this group of claims.

Claim 12 recites that the method is performed over all determined interior cities and all gateway cities that correspond to the determined interior cities appearing in the arbitraries to produce plural constructed fares. While Appellant concedes that the prior art construction technique would publish a listing of constructed fares, Appellant contends that to the extent that the any purported combination of Gardner with Appellant's admitted prior art and ATPCO used all possible minor cities and gateway cities to produce plural constructed fares, the prior art failed to perform the method over all determined interior cities and all gateway cities that correspond to the determined interior cities appearing in the arbitraries ... .

#### Claims 14, 15, 35, 43-46

For the purposes of this appeal only Claims 14, 15, 35 and 43-46 stand or fall together. Claim 35 is representative of this group of claims. Claim 35 is specifically directed to a ... computer program product for producing a set of constructed international fares for a particular airline.

As recited in claim 35, no combination of references suggests instructions to preprocess data by instructions to determine interior cities that appear with gateway cities in arbitraries ... and search a database for gateway cities corresponding to the determined interior cities appearing in the arbitraries or produce the constructed fares applying arbitraries corresponding to the

determined interior cities to published fares involving the gateway cities that correspond to the determined interior cities appearing in the arbitraries . . . . Claim 35 is more specifically directed to producing international constructed fares for a particular airline. No combination of these references suggests a specific process that produces international constructed fares for a particular airline. As generally described by Appellant [Specification page 4, line 24], advantages of Appellant's fare construction process include a process that produces "constructed fares" in a computational efficient manner. Thus, because of the efficiency of the algorithm the fare construction process can produce constructed fares on an "as needed basis", using the most current information such as currency conversion factors, prices, fares, and fare construction tables.

#### Claims 16 and 37

For the purposes of this appeal only Claims 16 and 37 stand or fall together. Claim 37 is representative of this group of claims.

Claim 37, which limits claim 35 and calls for instructions to determine a second set of interior cities that appear with second gateway cities in the published fares. This claim is not suggested by the combination of references. Neither Gardner nor ATPCO nor Applicant's admitted prior art suggest instructions to determine a second set of interior cities that appear with second gateway cities in the published fares. As generally discussed above, neither Gardner nor ATPCO nor Applicant's admitted prior art describes determining interior cities that appear with gateway cities.

#### Claims 17 and 38

For the purposes of this appeal only Claims 17 and 38 stand or fall together. Claim 38 is representative of this group of claims.

Claim 38 recites instructions to apply each arbitrary corresponding to each of the determined second set of interior cities to the first set of constructed fares to produce a second set of constructed fares is not described by the combination of references for analogous reasons as discussed in claim 37. Although ATPCO and Applicant's admitted prior art clearly discuss extending a published fare with an arbitrary (which is not disclosed or suggested in Gardner), no combination of these references suggest to apply each arbitrary corresponding to each of the

determined second set of interior cities to the first set of constructed fares to produce a second set of constructed fares.

Claims 20 and 41

For the purposes of this appeal only Claims 20 and 41 stand or fall together. Claim 41 is representative of this group of claims.

Claim 41 is allowable for analogous reasons as claim 9 and base claim 35. Claim 41 further limits claim 40 by evaluating entries by determining if an entry in a fare construction table was memoized before accessing the fare construction table . . . . The references do not suggest use of a memoization processing technique.

Claims 21 and 42

For the purposes of this appeal only Claims 21 and 42 stand or fall together. Claim 42 is representative of this group of claims.

Claim 42 further limits claim 35 to instructions to determine interior cities by accessing a first hash table by an airline, interior-city pair to return a list of gateway cities for which an airline has arbitraries that specify the interior city, and . . . access a second hash table by an airline, gateway pair to return a second list of gateway cities that an airline publishes fares from the determined gateway to another gateway city. No combination of the cited references discloses the use of hash tables in general or indexing of the hash table by an airline, interior-city pair. This indexing of the hash table enables this feature to return the list of gateway cities for which an airline has arbitraries that specify the interior city. In particular, this permits the fare construction process to produce the fares efficiently. The process that produces the hash tables can run in a time that is proportional to the number of entries. [See Appellant's specification page 8, line 18]. Once the hash tables have been produced, they only need to be modified during the fare construction process if there is a change (i.e., addition or removal) in arbitraries or gateway cities. Thus, in general, the hash table production process is a small, one-time fixed cost.

Claims 52, 53 and 55

For the purposes of this appeal only Claims 52, 53 and 55 stand or fall together. Claim 52 is representative of this group of claims.

Claim 52 is directed to a method of producing a set of constructed international fares for an airline. Claim 52 includes preprocessing by accessing a first hash table structure stored in computer memory by airline interior city pair to return a list of gateway cities for which an airline has arbitraries that specify the interior city, with arbitraries being published amounts and an ordered set of two cities that extend published fares to the gateway city from interior cities that include an amount for travel between two cities to provide a bi-directional market.

Claim 52 is neither described nor suggested by any combination of these references. Neither, Gardner, Applicant's admitted prior art, nor ATPCO suggest hash tables and in particular accessing a hash table by airline-interior city pair to return a list of gateway cities for which an airline has arbitraries. Claim 52, also requires accessing a second hash table by airline-gateway pair to return a second list of gateway cities that an airline publishes fares from to determine a gateway to another gateway city. These features of the hash tables that can access gateway cities by airline-gateway pair and airline-interior city pair are nowhere to be found in the cited references.

While ATPCO and Applicant's admitted prior art clearly disclose applying arbitraries to gateways to produce constructed fares, the claimed technique of: "applying the first arbitraries from the first hash table to the published fares from the second hash table to return a list of potential constructed fares" is not suggested nor enabled by these references.

#### Claim 54

Claim 54 further limits claim 52 by including a second set of interior cities that appear as arbitraries with the second gateway cities by accessing a third hash table by airline interior city pair to return a list of gateway cities for which an airline has arbitraries that specify the interior city. The combination of the references failed to suggest accessing the first two hash tables of base claim 52 and thus inherently cannot suggest much less describe accessing a third hash table. Moreover, by application of a cross product as taught in Applicant's admitted prior art, the combination of references also would fail to suggest, applying the arbitraries corresponding to the determined second set of interior cities to the first set of constructed fares to produce a second set of constructed fares.

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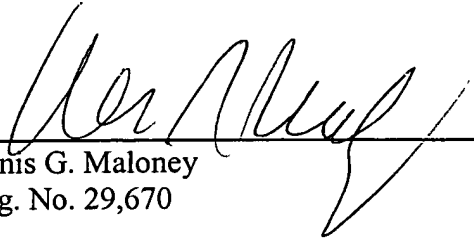
### Conclusion

Appellant submits that Claims 1-46 and 52-55 are allowable over "Gardner," in view of Applicant's Background of the invention and ATPCO Manual May 22, 1995. Therefore, the Examiner erred in rejecting Appellant's claims and should be reversed.

Respectfully submitted,

Date: \_\_\_\_\_

7/25/06

  
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### **Appendix of Claims**

1. A method of producing a constructed fare that includes an arbitrary added to a published fare, said method executed in a computer system having memory and a persistent storage device, the method comprising:

preprocessing by:

determining interior cities that appear with gateway cities in arbitraries for an airline, the arbitraries being published amounts and an order set of two cities that extend published fares that include an amount for travel between two cities to provide a bi-directional market; and

searching a database having published fares for gateway cities corresponding to the determined interior cities appearing in the arbitraries; and

producing the constructed fare, by:

applying an arbitrary corresponding to one of the interior cities to a published fare involving one of the gateway cities that corresponds to the determined interior cities appearing in the arbitraries to produce a constructed fare; and

storing the constructed fare in memory or the persistent storage device of the computer system for use in planning, faring and/or pricing.

2. The method of claim 1 wherein determining interior cities comprises:  
accessing a hash table indexed by an airline, interior-city pair to return a list of gateway cities for which an airline has arbitraries that specify the interior city.

3. The method of claim 2 wherein accessing a hash table returns the list in constant time.

4. The method of claim 1 wherein searching for gateway cities comprises:  
accessing a hash table indexed by an airline, gateway pair to return a list of gateway cities that an airline publishes fares from the determined gateway to another gateway city.

5. The method of claim 1 wherein determining interior cities comprises:



accessing a first hash table indexed by an airline, interior-city pair to return a list of gateway cities for which an airline has arbitraries that specify the interior city; and wherein searching for gateway cities further comprises:

accessing a second hash table indexed by an airline, gateway pair to return a second list of gateway cities that an airline publishes fares from the determined gateway to another gateway city.

6. The method of claim 5 wherein accessing the first and second hash table returns the lists in constant time.

7. The method of claim 1 wherein applying arbitraries further comprises:  
evaluating records from fare construction tables to determine whether the constructed fare is a valid constructed fare.

8. The method of claim 1 wherein the method is conditioned to allow any one or more of an airline code, interior city, a first gateway city, a second gateway city, or fare-basis to vary.

9. The method of claim 7 wherein testing entries further comprises:  
determining if an entry in a construction table was memoized before accessing the construction table; and  
if the entry was memoized, retrieving an answer from a store of memoized entries to apply to the constructed fare.

10. The method of claim 1 wherein the constructed fare is a two component constructed fare.

11. The method of claim 1, further comprising:  
determining a second set of interior cities that appear with a second gateway city in the published fare for the airline;

applying an arbitrary that extends the published fare to a city from the second set of interior cities to produce a three component constructed fare.

12. The method of claim 1 wherein the method is performed over all determined interior cities and all gateway cities that correspond to the determined interior cities appearing in the arbitraries to produce plural constructed fares.

13. The method of claim 1 wherein the method is performed over all airlines.

14. A method of producing a set of constructed international fares for a particular airline, the method executed in a computer system and the method comprising:

preprocessing by:

determining interior cities that appear with gateway cities in arbitraries for the particular airline, arbitraries being published amounts and an ordered set of two cities that extend published fares that include an amount for travel between two cities to provide a bi-directional market; and

searching a database for gateway cities corresponding to the determined interior cities appearing in the arbitraries; and

producing the constructed fares by:

applying arbitraries corresponding to the determined interior cities to published fares involving the gateway cities that corresponds to the determined interior cities appearing in the arbitraries to produce the set of constructed fares for the airline; and

storing the constructed fares in memory or the persistent storage device of the computer system for use in a travel related activity.

15. The method of claim 14 wherein the set of constructed fares are two component constructed fares.

16. The method of claim 14 further comprising:

determining a second set of interior cities that appear with second gateway cities in the published fares.

17. The method of claim 15 wherein the set of constructed fares is a first set of constructed fares and the method further comprises:

applying each arbitrary corresponding to each of the determined second set of interior cities to the first set of constructed fares to produce a second set of constructed fares.

18. The method of claim 17 wherein the first set of constructed fares are two component constructed fares and the second set of constructed fares are three component constructed fares.

19. The method of claim 14 further comprising:  
evaluating entries in fare construction tables to determine whether constructed fares in the set of constructed fares are valid constructed fares; and  
returning the valid constructed fares as the set of constructed fares.

20. The method of claim 19 wherein evaluating entries further comprises:  
determining if an entry in a fare construction table was memoized before accessing the fare construction table; and  
if the entry was memoized, retrieving an answer from a store of memoized entries to apply to the constructed fare.

21. The method of claim 14 wherein determining interior cities comprises:  
accessing a first hash table by an airline, interior-city pair to return a list of gateway cities for which an airline has arbitraries that specify the interior city; and  
wherein searching for gateway cities comprises:  
accessing a second hash table by an airline, gateway pair to return a second list of gateway cities that an airline publishes fares from the determined gateway to another gateway city.

22. A computer program product residing on a computer readable medium, for producing constructed fares that includes an arbitrary added to a published fare, comprising instructions for causing a computer system to:

preprocess data to determine interior cities that appear with gateway cities in arbitraries for the airline, arbitraries being published amounts and an ordered set of two cities that extend published fares that include an amount for travel between two cities to provide a bi-directional market;

search for gateway cities corresponding to the determined interior cities appearing in the arbitraries;

produce the constructed fare by applying an arbitrary corresponding to one of the interior cities to a published fare involving one of the gateway cities that corresponds to the determined interior cities appearing in the arbitraries to produce the constructed fare; and

store the constructed fare in a computer readable medium for use in a travel related activity.

23. The computer program product of claim 22 wherein instructions that cause a computer to determine interior cities comprises:

accessing a hash table by an airline, interior-city pair to return a list of gateway cities for which an airline has arbitraries that specify the interior city.

24. The computer program product of claim 23 wherein instructions that cause a computer to access a hash table returns the list in constant time.

25. The computer program product of claim 22 wherein instructions that cause a computer to search for gateway cities comprises instructions that cause a computer to:

access a hash table by an airline, gateway pair to return a list of gateway cities that an airline publishes fares from the determined gateway to another gateway city.

26. The computer program product of claim 22 wherein instructions that cause a computer to determine interior cities comprises instructions that cause a computer to:

access a first hash table by an airline, interior-city pair to return a list of gateway cities for which an airline has arbitraries that specify the interior city; and

wherein instructions that cause a computer to search for gateway cities comprises instructions that cause a computer to:

access a second hash table by an airline, gateway pair to return a second list of gateway cities that an airline publishes fares from the determined gateway to another gateway city.

27. The computer program product of claim 26 wherein instructions that cause a computer to access the first and second hash table returns the lists in constant time.

28. The computer program product of claim 22 wherein instructions that cause a computer to apply arbitraries further comprises instructions that cause a computer to:

test entries in construction tables to determine whether the constructed fare is a valid constructed fare.

29. The computer program product of claim 28 wherein instructions that cause a computer to test entries further comprises instructions that cause a computer to:

determine if an entry in a construction table was memoized before accessing the construction table; and

if the entry was memoized, retrieve an answer from a store of memoized entries to apply to the constructed fare.

30. The computer program product of claim 22 wherein the constructed fare is a two component constructed fare.

31. The computer program product of claim 22 wherein the computer program product is conditioned to allow any one or more of an airline code, interior city, a first gateway city, a second gateway city, or fare-basis to vary.

32. The computer program product of claim 22, further comprising instructions that cause a computer to:

determine a second set of interior cities that appear with a second gateway city in the published fare for the airline; and

apply a second interior city from the second set of interior cities to the constructed fare to produce a three component constructed fare.

33. The computer program product of claim 22 wherein the computer program product is executed over all determined interior cities and all gateways.

34. The computer program product of claim 22 wherein the computer program product is executed over all airlines.

35. A computer program product for producing a set of constructed international fares for an airline, the computer program product residing on a computer readable medium and comprising instructions that cause a computer to:

preprocess data by instructions to:

determine interior cities that appear with gateway cities in arbitraries for the airline, arbitraries being published amounts and an ordered set of two cities, that extend published fares that include an amount for travel between two cities to provide a bi-directional market;

search for gateway cities corresponding to the determined interior cities appearing in the arbitraries; and

produce fares by instructions to:

apply each arbitrary corresponding to each of the determined interior cities to published fares involving the gateway cities that corresponds to the determined interior cities appearing in the arbitraries to produce the set of constructed fares; and

store the constructed fares to a computer memory or persistent storage for use in a travel related activity.

36. The computer program product of claim 35 wherein the set of constructed fares are two component constructed fares.

37. The computer program product of claim 35 further comprising instructions that cause a computer to:

determine a second set of interior cities that appear with second gateway cities in the published fares.

38. The computer program product of claim 36 wherein the set of constructed fares is a first set of constructed fares, and the computer program product further comprises instructions that cause a computer to:

apply each arbitrary corresponding to each of the determined second set of interior cities to the first set of constructed fares to produce a second set of constructed fares.

39. The computer program product of claim 38 wherein the first set of constructed fares are two component constructed fares and the second set of constructed fares are three component constructed fares.

40. The computer program product of claim 35 further comprising instructions that cause a computer to:

evaluate entries in fare construction tables to determine whether constructed fares in the set of constructed fares are valid constructed fares; and

return the valid constructed fares as the set of constructed fares.

41. The computer program product of claim 40 wherein instructions that cause a computer to evaluate entries further comprises instructions that cause a computer to:

determine if an entry in a fare construction table was memoized before accessing the fare construction table; and

if the entry was memoized, retrieve an answer from a store of memoized entries to apply to the constructed fare.

42. The computer program product of claim 35 wherein instructions that cause a computer to determine interior cities comprises instructions that cause a computer to:

- access a first hash table by an airline, interior-city pair to return a list of gateway cities for which an airline has arbitraries that specify the interior city; and
- wherein instructions that cause a computer to search for gateway cities comprises instructions that cause a computer to:
  - access a second hash table by an airline, gateway pair to return a second list of gateway cities that an airline publishes fares from the determined gateway to another gateway city.

43. A computer system comprising:

- a processor;
- a memory for storing instructions executed by the processor; and
- a storage medium storing a computer program product for producing a set of constructed international fares for an airline, the computer program product comprising instructions that cause the processor to:
  - preprocess data by instructions to:
    - determine interior cities that appear with gateway cities in arbitraries for the airline, arbitraries being published amounts and an ordered set of two cities that extend published fares that include an amount for travel between two cities to provide a bi-directional market;
    - search for gateway cities corresponding to the determined interior cities appearing in the arbitraries; and
    - produce constructed fares by instructions to:
      - apply each arbitrary corresponding to each of the determined interior cities to published fares involving the gateway cities that corresponds to the determined interior cities appearing in the arbitraries to produce the set of constructed fares; and
      - store the constructed fares in a computer memory or persistent storage for use in a travel related activity.

44. The computer system of claim 43 wherein the system is a stand-alone computer.



45. The computer system of claim 43 wherein the system is a server computer in a networked, client-server computer system.

46. The computer system of claim 43 wherein the system is a client computer in a networked, client-server computer system.

Claims 47- 51 were canceled.

52. A method of producing a set of constructed international fares for an airline, the method executed in a computer system and the method comprising:

preprocessing by:

accessing a first hash table structure stored in computer memory by airline interior city pair to return a list of gateway cities for which an airline has arbitraries that specify the interior city, with arbitraries being published amounts and an ordered set of two cities that extend published fares to the gateway city from interior cities that include an amount for travel between two cities to provide a bi-directional market;

accessing a second hash table structure stored in computer memory by airline gateway pair to return a second list of gateway cities that an airline publishes fares from to determine a gateway to another gateway city;

producing constructed fares by:

applying the first arbitraries from the first hash table to the published fares from the second hash table to return a list of potential constructed fares;

determining whether a constructed fare in a list of constructed fares is a valid constructed fare and for valid ones of the potential constructed fares producing the constructed fares; and

storing the constructed fares in a computer memory or persistent storage for use in a travel related activity.

53. The method of claim 52 wherein the constructed fares are two component constructed fares.

54. The method of claim 52 further comprising:  
determining a second set of interior cities that appear as arbitraries with the second gateway cities by accessing a third hash table by airline interior city pair to return a list of gateway cities for which an airline has arbitraries that specify the interior city; and  
applying the arbitraries corresponding to the determined second set of interior cities to the first set of constructed fares to produce a second set of constructed fares.

55. The method of claim 54 wherein the first set of constructed fares are two component constructed fares and the second set of constructed fares are three component constructed fares.

Applicant : David M. Baggett  
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### **Evidence Appendix**

**None**

### **Related Proceedings Appendix**

**None**

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